Zero Exponent

Example 1 $4^2 \div 4^2 = 4^{2-2} = 4^0$

 # Using the definition of an exponent, that does not make sense.

Using the Multiplicative Inverse, we know a number divided by itself equals 1

$$1 = \frac{4^2}{4^2} = 4^0$$

Using the Transitive Property, $4^0 = 1$

Any number raised to the zero power, except 0, equals 1

$A^0, A \neq 0 = 1$

Why the exception?

Evaluate In Exponential Notation

1)

$$\frac{4^2 \cdot 4^5 \cdot 4^3}{4^2 \cdot 4^5}$$

2)

$$\frac{7^3 \cdot 7^5}{7^2 \cdot 7^3}$$

3)

$$\frac{3^2 \cdot 5^3 \cdot 3^5 \cdot 5^4}{3^4 \cdot 5^2}$$

4)

$$\frac{6^7 \cdot 5^8 \cdot 6^4}{6^8 \cdot 5^3}$$

5)

$$\frac{5^7 \cdot 10^3 \cdot 5^6 \cdot 10^2}{5 \cdot 10^2 \cdot 5^2}$$

6)

$$\frac{6^4 \cdot 7^2 \cdot 7^3}{7^4 \cdot 6^3}$$